

## CLAIMS

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1. Bioactive dishes for cell cultures comprising on their bottom a bilayer comprising an internal primary layer made of hydroxypropylmethylcellulose (HPMC), or polyvinyl alcohol (PVA) in contact with the bottom of the dishes, and an external bioactive layer made of carboxypropylmethylcellulose situated on said internal layer.

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2. Bioactive dishes according to claim 1, characterized in that they are presented in the form of Petri dishes, such as polystyrene Petri dishes of commercial origin, or in the form of multi-well plates, on the bottom of which the bilayer is situated.

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3. Bioactive dishes according to claim 1 or 2, characterized in that the thicknesses of the internal HPMC or PVA layer, and of the external CMC layer, are a few microns, in particular approximately 1 to 5 microns.

4. Method for preparing bioactive dishes according to one of the claims 1 to 3, characterized in that it comprises:

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- a stage of activation of the surface of the bottom of the dishes by electromagnetic discharges,
- the depositing of the internal HPMC layer on the bottom of the dishes, then drying,
- the depositing of the external bioactive layer on the dried primary layer obtained in the preceding stage, then drying.

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5. Use of bioactive dishes according to one of claims 1 of 3, to carry out:
- methods for studying cell ageing, cell differentiation, and apoptosis,
  - methods for screening anti-ageing molecules intended to prevent and delay the effects of ageing,
  - methods for screening antitumor molecules intended for the treatment of cancer,

- methods for *in vitro* diagnosis of tumor-cell malignancy by measurement of the residual ability of cancer cells to differentiate, and to enter into apoptosis and therefore methods for *in vitro* tumor prognosis,

- study methods relating to research into signalling controlling morphology, bioadhesion, cell proliferation and intercellular communication.

6. Method for studying cell ageing, cell differentiation, and apoptosis, characterized in that it comprises:

- a stage of culturing cells to be studied in the dishes defined in one of claims 1 to 3,

- the observation of the cells by microscope in order to study their morphology,

- and/or the detection, or even the quantification, of cell differentiation, by measurement of cell proliferation, synthesized proteins, and specific membrane markers expressed,

- and/or the detection, or even the quantification, of the apoptosis of the cells, by measurement of viability, activation of the caspases, chromatin fragmentation, or formation of apoptotic bodies.

7. Method for screening anti-ageing molecules intended to prevent and delay the effects of ageing, characterized in that it comprises:

- a stage of culturing cells, such as fibroblasts, in the presence of the anti-ageing molecules to be studied, in the culture dishes defined in one of claims 1 to 3,

- the observation of the cells by microscope in order to study their morphology,

- and/or the detection, or even the quantification, of the proliferation and syntheses,

- and the comparison with the observations and results obtained on cultures of cells used as controls, said control cultures being carried out by culturing said cells in the absence of said anti-ageing molecules to be studied, in the dishes defined in one of claims 1 to 3.

8. Method for screening antitumor molecules intended for the treatment of cancer, characterized in that it comprises:

- a stage of culturing cells, such as animal or human melanoma cells, in the presence of the antitumor molecules to be studied, in the culture dishes defined in one of claims 1 to 3,

- observation of the cells by microscope in order to study their morphology and their differentiation,

- and/or the detection, or even the quantification, of their proliferation, differentiation and apoptosis,

- and comparison with the observations and results obtained on cell cultures used as controls, said control cultures being carried out by culturing said cells in the absence of said antitumor molecules to be studied, in the culture dishes defined in one of claims 1 to 3.

9. Method for *in vitro* diagnosis of the malignancy of tumor cells by measurement of the residual ability of cancer cells to differentiate, characterized in that it comprises:

- a stage of culturing cancer cells, such as human melanoma cells obtained from biopsies, in the culture dishes defined in one of claims 1 to 3,

- the observation of the cells by microscope in order to study their morphology and differentiation, and/or the detection, or even the quantification, of their proliferation viability and apoptosis.

10. Application of the diagnosis method according to claim 9 to the *in vitro* prognosis of tumors.